

XII. *Studies of the Tetriginæ (Orthoptera) in the Oxford University Museum.* By J. L. HANCOCK, M.D., F.E.S. (Chicago).

[Read 28th March, 1907.]

PLATE XXI.

THE following notes and descriptions relating to Orthoptera are based on the collection of *Tetriginæ* contained in the Hope Department of Zoology, University Museum, Oxford, England. The writer is indebted to Mr. R. Shelford, who generously supplied for determination the present collection. Besides this material, the writer has drawn upon some examples of these insects in his own collection, which have not hitherto been recorded.

This article forms a sequel to various published contributions by the writer bearing on the *Tetriginæ*, the last of which appeared in "Genera Insectorum."\*

Section TRIPETALOCERÆ, Bolivar.

Genus TRIPETALOCERA, Westwood.

1. *T. ferruginæa*, Westwood, Zool. Journ., vol. v, p 444, Pl. xxii, f. 3.

One male example from Kuching, N.W. Borneo, Dyak coll., R. Shelford; Oxford Museum.

Section DISCOTETTIGIÆ, Hancock.

Genus DISCOTETTIX, Costa.

1. *D. belzebuth*, Serville, Hist. Nat. Ins. Orthoptera, p. 759, 1839.

Five examples from Kuching, N.W. Borneo, Dyak. coll., R. Shelford. One of these, an immature specimen, presented by the Sarawak Museum; Oxford Museum.

\* Genera Insectorum, 48me Fascicule, Orthoptera, Fam. *Acridiidæ*, Subfam. *Tetriginæ*, 4 Plates (P. Wytzman), pp. 79, 1906.

2. *D. shelfordi*, sp. nov.

Cinereous or fuscous, body rugose, conspersed with coarse granulations; superior ocelli placed between the middle of the eyes. Antennæ inserted little below and anterior to the ventro-anterior margin of the eyes, not at all serrulate, from the sixth to the eighth articles moderately compresso-dilated, the sixth only a little so modified, the ninth oval, the two apical articles very small, the apex of last joint acute. Frontal costa distinctly protuberant between the antennæ, and advanced much further than the eyes. Pronotum truncate anteriorly, the two prozonal carinæ behind the anterior margin parallel, dorsum rugose-subnodulose, strongly flattened, presenting sulcations anteriorly: humeral angles little produced laterally, behind the shoulders subfossulate, and subgibbose, with a pair of gibbose tubercles posteriorly about midway between the humeral angles and base of process; the course of median carina serrulate, indistinctly and irregularly subtuberculose; lateral marginal carinæ often bearing a number of small shining, somewhat obtuse tubercles, each humeral angle presenting one at the apices; pronotal process rather stout, little depressed, lengthily extended beyond the apex of posterior femora; lateral lobes little laminate outwards, the posterior angle excavato-truncate and angulate subacute, not at all serrulate or spinose. Elytra moderately large, distinctly acuminate towards the apices; wings fully explicate, as long as the process. Femora elongate, margins minutely serrulate; anterior femora above somewhat subbilobate; middle femora above subtrilobate, the posterior tibiae serrulate, but not at all spinose. Length of male and female, entire, 17·5-19 mm.; pronotum 16-18·5 mm.; posterior femora 6-8·5 mm.

Three examples from Kuching, N.W. Borneo, Dyak coll., R. Shelford; Oxford Museum.

A very distinct species resembling, perhaps, *D. scabridus*, Stal, more than any other member of the genus.\*

## Genus PHÆSTUS, Bolivar.

1. *P. insularis*, sp. nov.

Stature small, cinereo-fuscous. Body somewhat smoothly granulate. Head not at all exserted; vertex narrowed forward, nearly equal in front to one of the eyes, anteriorly subtruncate, transversely lightly carinate, advanced about as far as the anterior fourth of the eyes,

\* Named in honour of Mr. R. Shelford, whose interest in the Oxford Museum is shown by the large series of Orthopteran specimens bearing his name as the donor.

fossulate on each side of the feeble, abbreviated, median carina ; frontal costa strongly protuberant between the antennæ and rather narrowly sulcate ; superior ocelli placed between the submedian part of the eyes, visible in profile ; antennæ inserted little anterior to and scarcely below the ventro anterior margin of the eyes, filiform, but the fifth and sixth articles little compresso-expanded, the seventh to ninth distinctly compresso-dilated, the two apical articles minute, the apices acute. Pronotum anteriorly little rounded produced, posteriorly acuminate, extended little beyond the apices of the posterior femora ; anterior prozonal carinæ behind the anterior margin wanting, median carina little acute, percurrent, in profile substraight ; anterior sulci subobsolete, humeral angles wanting, the humero-apical carinæ percurrent backward, and forward extended as far as the point opposite and above the inferior sinus ; lateral lobes turned down, the posterior angles obtuse. Elytra small elongate, sublanceolate ; wings fully explicate, extended to or little beyond the apex of pronotal process. Anterior and middle femora elongate, the margins straight, entire ; the posterior femora little incrassate, the superior margin arcuate, minutely serrulate, posterior tibiæ plurispinose and minutely serrulate, the inner fourth part toward the apices unarmed, the three pulvilli of the first article of posterior tarsi equal in length, subacute. Length of body, female entire, 9·5-10 mm. ; posterior femora 5-5·5 mm.

Three examples from Kuching, N.W. Borneo ; two of these from the Sarawak Museum, No. 337 and 357, and the other Dyak coll., R. Shelford ; Oxford Museum.

The antennæ in this species are more compressed than in *P. mellerborgi*, Stål, and the facial frontal costa is more narrowly sulcate.

#### Section CLADONOTÆ, Bolivar.

##### Genus DELTONOTUS, Hancock.

1. *D. tectiformus*, Hancock, *Spolia Zeylanica*, vol. ii, p. 111-112, Pl. I, figs. 2-2a, 1904.

Two examples from Pundaluoya, Ceylon ; Oxford Museum.

These specimens have the pronotum less produced anteriorly than the type examples in the author's collection, from the same locality, and are provisionally considered immature. It is however possible that they are

distinct from *tectiformus*, and two in my collection from Hantane, Ceylon, bear the label "*D. cristatus*, sp. nov.," awaiting study of a larger series to settle the matter.

#### Genus POTUA, Bolivar.

1. *P. coronata*, Bolivar, Ann. Soc. Ent. Belg., vol. xxxi, p. 208, Pl. I, fig. 9, 1887.

Four examples from Kuching, N.W. Borneo, R. Shelford; Oxford Museum.

#### Genus EPITETIX, nov.

Stature small, body somewhat smooth but densely punctate. Vertex broad, little narrowed forward, much wider than one of the eyes, anteriorly not at all transversely carinate but on each side with a very small, though distinct elongate longitudinal carina, front margin convex, with an abbreviated somewhat thickened and produced median carina; face oblique; superior ocelli placed between the lower third of the eyes; the face together with the crown of head forming an obtuse angulate profile, frontal scutellum not divided above the posterior ocelli, triangular, and the margins but little elevated, not produced in profile; antennæ inserted little forward and below the ventro-anterior margins of the eyes, the distance between them much wider than that to the eyes. Pronotum anteriorly truncate, posteriorly cuneate, with subacute apex, not extended backward to the apices of the posterior femora; median carina percurrent, distinct, and substraight, dorsum subtectiform, punctate, prozonal carinæ behind the anterior border somewhat indistinct; humeral angles almost wanting; lateral lobes little reflexed outwards, the posterior angles obliquely truncate behind. Elytra and wings wanting; margins of anterior and middle femora entire, posterior femora little incrassate and of ordinary form, the margins of posterior tibiæ plurispinose, and minutely serrulate, the first articles of the posterior tarsi strongly larger than the third, the three pulvilli about equal in length. Resembling *Diotarus*, Stål.\* Type, *Epitetix punctatus*.

1. *E. punctatus*, sp. nov. (Plate XXI, fig. 1.)

Fuscous, with the posterior half of dorsum and upper distal half of hind femora flavo-ferruginous, the anterior and middle tibiæ

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\* This genus may be assigned to my Subsection II, under *Cladonotæ*, and next to *Diotarus*, Stål, as given in my key in Genera Insectorum. Vide p. 9, 10, 48me Fasc. Orthop. Subfam. *Tetriginæ*, 1906.

light, annulate with fuscous. Apical articles of maxillary palpi little dilated, oval. Length of body entire, male, 10 mm. ; pronotum 7 mm. ; posterior femora 5 mm.

One example from Kuching, N. Borneo, R. Shelford ; Oxford Museum.

Genus CLADORAMUS, nov.

This genus differs from *Pantelia*, which it most resembles, in the anterior margin of pronotum being profoundly produced forward over the head, forming a process, in the sulcation of the forward dorsal margin of crest, the presence of strongly carinate-crenulate humeral angles which are little produced outwards, and in the lateral lobes of pronotum bearing a superior or elytral sinus for the reception of the elytra, the latter being of ordinary form.

1. *C. crenulatus*, sp. nov. (Plate XXI, fig. 2.)

Greyish, body strongly rugose, somewhat sparingly provided with small subspiniiform tubercles. Face nearly vertical, viewed in profile wholly denticulate ; vertex very broad, on each side forward adjoining the eyes armed with an obliquely produced spine, the middle backward denticulate, and forward strongly armed with produced denticles between the eyes ; frontal scutellum with convex sides, the margins denticulate produced, the facial median carina below as well as face on each side denticulate ; eyes small and subsessile ; the three apical articles of the maxillary palpi compresso-dilated ; antennæ inserted far below the eyes, the distance between them and that to the eyes nearly equal. Pronotum rugose, strongly tectiform and cristate, anteriorly profoundly produced beyond the head, in the form of a sublongitudinal process, posteriorly extended only little beyond the apices of the posterior femora ; the anterior process viewed from above presenting a strongly spinose margin below on each side, the apex bifid and the upper dorsal margin distinctly sulcate ; viewed in profile the whole dorsal crest little elevated somewhat horizontally, but the anterior half undulato-crenulate, the process anteriorly little arcuate above, at the middle behind the shoulders somewhat angulate ; from here backwards strongly sinuato-dentate, the apex very little turned downward behind ; humeral angles strongly carinate, little produced outwards, and strongly crenulate ; lateral lobes of pronotum posteriorly bisinuate, below widely laminate outwards subhorizontally, arcuate anteriorly, posteriorly often armed with three obtuse denticles or crenulate. Elytra

of moderate size, elongate sublanceolate, where they rest at the sides, the inferior lateral margin of pronotum little arcuato-excavate for their reception; wings wanting. Anterior femora strongly compresso-foliolate, scarcely longer than wide, the superior margin sinuate, below coarsely crenulate; anterior tibiæ strongly compresso-ampliate behind the middle, above canaliculate, with a spur midway on the margins, behind the inner margin toward the distal extremity armed with acute spines (about five), middle femora externally tuberculose, margin above strongly acute-sinuate and denticulate, below lobato-crenulate, middle tibiæ ampliate at the middle, the superior inner margin furnished with denticulate lobes; hind femora externally strongly rugose and armed with spinous tubercles, the outer carina below, as viewed from above bearing strongly denticulate lobes at the middle, and at the apical fourth similarly armed, though not so pronounced, knees denticulate on the sides and above, the lower margin of hind femora strongly lobato-denticulate, the posterior tibiæ rather stout, the canthi crenulate and plurispinose, the inner canthus regularly spined, the third pulvilli of the posterior tarsi little longer than the first or second articles, straight below. Length of the body entire, female, 11 mm.; pronotum 12·8 mm.; anterior process of pronotum 2·5 mm.; posterior femora 5·5 mm.

One female example from Rhodesia, East Loangwa, Africa, S. A. Neave; Oxford Museum.

#### Section SCELIMENÆ, Bolivar.

##### Genus SCELIMENA, Serville.

1. *S. producta*, Serville, Hist. Nat. Ins. Orthopt., p. 762, 1837.

One example from East, and three from West Java, H. Fruhstorfer; Oxford Museum.

2. *S. sanguinolenta* (Krauss), Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 216–217, 1887.

One example from East, and three from West Java; Oxford Museum.

3. *S. logani*, Hancock, Spolia Zeylanica, vol. ii, p. 120–122, figs. 5–5c, Pl. I, 1904.

Two examples from Kelawaewa, N.C. Province, Ceylon; Oxford Museum.

4. *S. gaviialis*, Saussure, Ann. Soc. Ent. France, p. 485, 1860.

Three examples. One from Pundoluoya, and two from Kandy, Ceylon; Oxford Museum.

5. *S. india*, sp. nov.

Resembling *S. producta* but slightly stouter in stature. Body fuscous, pale variegated, the carinæ of dorsum flavo-maculate, the tibiæ with pale annuli. Vertex subequal in width to one of the eyes, the frontal carinæ on each side little compressed and subacute. Pronotum anteriorly somewhat subangulate, posteriorly extended beyond the knees of the hind femora about as far as the tibial apices, but not so lengthily attenuate as in *producta*; dorsum conspersed with granules; depressed and uneven, between the sulci forwards subfossulate on each side, between the shoulders bearing subelevated longitudinal costate protuberances, humeral angles unarmed, behind the shoulders bifossulate, and presenting a pair of rounded subelevated nodules, again another pair somewhat fused together appear posteriorly opposite the middle of the hind femora which are indistinct; posterior process stout at the base and acuminate toward the apex; median carina rather incrassate, unevenly undulate, anteriorly at the margin little protuberant and subtuberculate: lateral lobes at the anterior margin armed with small tubercles, the posterior margin little laminate outwards, and armed with a distinct, acute spine on each side, directed transversely but little curved forward. The posterior femoral margins entire, the posterior tibiæ armed with minute denticles, the margins dilated towards the apices; the first article of the posterior tarsi dilated but not so widely as in *producta*. Length of body entire, male, 19.5 mm.; pronotum 18 mm.; posterior femora 7 mm.

Two examples from Cherrapunji, Assam; Oxford Museum.

Genus *CHTHONOTETTIX*, Hancock.\*

1. *C. palpatus*, Stål, Ofv. Vet. Akad. Forh., p. 57, 1877.  
= *Chthonius palpatus*, Bolivar. (Plate XXI, fig. 3.)

Body sparingly granulose, fuscous, obscurely variegated with flavous. Vertex distinctly narrower than one of the eyes, the anterior carinæ rounded oblique; eyes globose; frontal costa roundly protuberant between the antennæ, narrowly sulcate and divided little above the posterior ocelli, the latter situated between the lower third of the eyes, conspicuous in profile; antennæ inserted scarcely

\* The name *Chthonotettix* was proposed by the present author (vide Genera Insectorum, 48me Fasc. Orthoptera, Subfam. *Tetriginæ*, p. 26, 1906) to replace Bolivar's preoccupied genus *Chthonius*.

below and anterior to the ventro-anterior border of the eyes. Pronotum truncate anteriorly, posteriorly lengthily extended beyond the knees of the hind femora; median carina often interrupted, disappearing anteriorly behind the frontal margin and posteriorly on the apical process, in profile little gibbulous between the shoulders, posteriorly sinuate; dorsum depressed, with abbreviate costa between the humeral angles, strongly fossulate behind the humeral angles, subnodulose in single order posteriorly, and the process toward the extremity smooth and cylindrical; lateral lobes little laminate, the posterior angles armed with distinct transverse spine on each side, acute. Elytra moderately large, elongate sublan- ceolate; wings fully explicate but not quite reaching to the pronotal apex. Femoral margins entire, anterior and middle femora very slender, nearly equal in length; margins of posterior tibiæ moderately dilated, sparingly armed with small denticles, the inner canthus unarmed at the distal fourth; the first articles of the posterior tarsi not at all dilated, the three pulvilli equal in length and straight below. Length of body entire, female, 22 mm.; pronotum 20.5 mm.; posterior femora 8.5 mm.

One example, No. 2772, from Luzon, Manilla, Philip- pines, E. L. Meyer; Oxford Museum.

#### Genus GAVIALIDIUM, Saussure.

1. *G. crocodilus*, Saussure, Ann. Soc. Ent. France, p. 481, 1860.

Four examples from Pundaluoya, Ceylon. Oxford Museum.

#### Genus OXYNOTUS, Hancock.

1. *O. hastatus*, Hancock, Occas. Mem. Chicago Ent. Soc., vol. i, No. 1, p. 12, 13, Pl. I, figs. 3-3a, 1900.

One example from N.E. Madagascar, Bay of Antongil, Mocquerys; Oxford Museum.

#### Genus CRIOTETTIX, Bolivar.

- C. tricarinatus*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 224, 1887.

Eleven examples from Pundaluoya, and other points in Ceylon; Oxford Museum.

2. *C. flavopictus*, Bolivar, Ann. Soc. Ent. France, vol. lxx, p. 582, 1902.

Two examples from Cherrapunji, Assam; Oxford Museum.



3. *C. oculatus magnus*, var. nov.

This form nearly resembles the Sumatran species *oculatus*, Bolivar, but differs in being larger in stature.

Length of body entire, male and female, 15-18 mm. ; pronotum 14-17.5 mm. ; posterior femora 5.5-7 mm.

Five examples from West and Mid Java; Oxford Museum; numerous examples in the author's collection.

Genus ACANTHALOBUS, Hancock.

1. *A. rugosus*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 228, 1887.

Five examples are referable to this species, they are from Kuching, N.W. Borneo, R. Shelford; Oxford Museum.

2. *A. saginatus*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 225, 1887.

Seven examples, including specimens from Java and China; Oxford Museum.

3. *A. longinotus*, sp. nov.

This species is closely allied to *A. rugosus*, Bolivar, and might possibly be the long-winged form of the latter. It differs principally in the pronotum being strongly extended backward beyond the femoral apices, and in the body being somewhat stouter. It bears moreover a near resemblance to *nexuosus* also, but it is smaller in stature. Ferruginous or tending to fuscous. Vertex wider than one of the eyes, very little narrowed forward, very slightly marginate on each side anterior to the lateral supraocular lobes, median carina abbreviated; frontal costa very sparingly compresso-elevated between the antennæ, in profile scarcely sinuate below the median ocellus, above declivous. Pronotum anteriorly truncate, posteriorly lengthily extended beyond the femoral knees; dorsum convex between the shoulders, subfossulate behind them, the surface rugose, irregularly furnished with abbreviated rugæ and tubercles, posterior angle of the lateral lobes triangular, somewhat acute, but not spinose. Wings little longer than pronotum in the female. Anterior and middle femora margins subentire, the posterior femoral margins minutely serrulate. Length of body entire, male and female, 16.5-19 mm. ; pronotum 16-17.5 mm. ; posterior femora 6.5-7.6 mm.

Seven examples from N.W. Borneo, R. Shelford; Oxford Museum.

4. *A. fuscus*, sp. nov. (or var. ?).

Similar in stature to *longinotus*, but entirely fuscous (as in *nexuosus*), the vertex wide, and the frontal costa more roundly produced between the antennæ, and sinuate below the median ocellus, the lateral margin of vertex with distinct lobes and marginate on each side forward. Dorsum of pronotum very strongly rugose, plentifully furnished with abbreviated rugæ, and tubercles irregularly disposed; in profile the median carina of pronotum strongly sinuate, little subnodulose forward, and distinctly depressed behind the shoulders; lateral lobes little more reflexed outwards, the triangular posterior angle little more acute and somewhat spinose. Length of body entire, female, 18 mm.; pronotum 16·8 mm.; posterior femora 8 mm.

One example from N.W. Borneo, R. Shelford; Oxford Museum.

5. *A. miliarius*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 226, 1887.

Two examples from Pundaluoya, Ceylon; Oxford Museum.

6. *A. miliarius cuneatus*, Hancock, Spolia Zeylanica ii, part vii, p. 133, 1904.

Three examples from Ceylon; Oxford Museum.

7. *A. robustus*, sp. nov.

A stouter form than either *longinotus* or *rugosus*, and like the latter having abbreviated wings and pronotal process not at all or very little extended beyond the knees of the hind femora; dorsum between the shoulders rather broader; colour ferruginous or fuscous; the vertex distinctly wider than one of the eyes; lateral lobes of pronotum decidedly reflexed outwards, the posterior angles triangular but not at all spinose; dorsum of pronotum strongly rugose and tuberculose; the third articles of the posterior tarsi (in the female) little longer than the first or the second. Length of body entire, male and female, 13·8–15·4 mm.; pronotum 13–14 mm.; posterior femora 7–9 mm.

Two examples from Kuching, N.W. Borneo. One of these from the Sarawak Museum, the other from R. Shelford; Oxford Museum.

8. *A. bispinosus*, Dalman, Vet. Akad. Hand., p. 77, 1818.

One example from Penang, Malacca, E. L. Meyer; Oxford Museum, No. 3452.

Genus LOXILOBUS, Hancock.

1. *L. assamus*, sp. nov.

A small form, with abbreviated wings and pronotal process. Cinereous or ferruginous, often infuscate on the sides and legs; vertex subequal in width to one of the eyes, advanced as far as the eyes, narrowed forward, distinctly longitudinally sulcate on each side; frontal costa in profile convex. Pronotum anteriorly truncate, posteriorly cuneate, extended backward as far as the hind femoral knees; dorsum tuberculose, subcostate between the shoulders, and here somewhat convex, deplanate posteriorly; median carina of pronotum sinuate in profile, sometimes little elevated forward, before the shoulders; lateral lobes little laminate outwards and subtriangular, obliquely truncate; margins of anterior and middle femora entire, the third articles of the posterior tarsi, with the third pulvilli longest, the apices of the first and second acute. Elytra elongate, with rounded apices; wings abbreviated, little shorter than the pronotal process.

Three examples from Cherrapunji, Assam; Oxford Museum.

2. *L. truncatus*, sp. nov.

Resembling *acutus*, but having the lateral lobes of pronotum little dilated, and obliquely truncate behind, the posterior angles distinct, but not acute, the dorsum of pronotum lightly rugose, but without distinct lineate rugæ or tubercles; wings fully explicate and extended backward as far as the pronotal process. Length of body entire, female, 14 mm.; pronotum 13 mm.; posterior femora 6·2 mm.

One example from Kuching, N.W. Borneo, Dyak coll., R. Shelford; Oxford Museum.

3. *L. insidiosus*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 228, 1887. (*Criotettix insidiosus* of Bolivar.)

One example from Kuching, N.W. Borneo, R. Shelford; Oxford Museum.

Genus BOLOTETTIX, nov.

Body conspersed with granules or somewhat punctate. Vertex strongly narrower than one of the eyes, subacuminate forward and little ascendant, subsulcate on each side of the feeble median carina, the lateral margins anteriorly provided with suboblique carinæ open in front, and bear small indistinct supraocular lobes; frontal costa in profile little compresso-elevated between the antennæ, viewed in

front narrowly compressed and sulcate little above the posterior ocelli, the rami below moderately divergent toward the median ocellus; eyes large and strongly globose, somewhat prominently elevated; posterior ocelli placed near the lower third of the eyes; palpi with the apical articles little compresso-dilated; antennæ filiform and very slender, inserted scarcely below the antero-ventral border of the eyes. Pronotum anteriorly truncate, posteriorly subulate, often extended little beyond the hind femoral apices; dorsum anteriorly cylindrical, the prozonal and lateral carinæ before the shoulders wanting; between the shoulders backward deplanate, and behind the shoulders often subbifossulate; median carina forward behind the anterior margin wanting, in front of the shoulders somewhat compresso-arcuate; lateral lobes of pronotum posteriorly bisinuate, the posterior angles moderately laminate, and on each side strongly armed with a transversely produced spine, or rarely little produced. Elytra very small and lanceolate; wings fully explicate, not extended so far as the apex of pronotal process or about as far. Anterior and middle femora narrow, elongate, carinæ entire, posterior femoral margins serrulate, the genicular denticles moderately distinct, posterior tibiæ scarcely at all ampliate toward the apices, with the canthi compressed, spinose, and minutely serrulate, the first and third articles of the posterior tarsi subequal or the first little longest. Type *Bolotettix validispinus*.

This genus is readily distinguished from *Criotettix*, which it most resembles, in the very narrow subacuminate vertex, the absence of the anterior prozonal and lateral carinæ on the dorsum of pronotum, the cylindrical character of the forward part of the pronotum, the strongly-produced spines arming the posterior angles of the lateral lobes, the very small elytra, and the insertion of the antennæ barely below the eyes.

1. *B. validispinus*, sp. nov. (Plate XXI, fig. 5.)

Dark ferruginous, the face and legs lighter, the lateral thoracic spines and borders of pronotum rufescent, posterior femora externally below longitudinally striated with fuscous, posterior tibiæ and under parts of body fuscous. Face oblique; vertex ascendant forward, in front reduced to nearly one-half the width of one of the prominent and globose eyes, anteriorly subobliquely marginate on each side, in profile not at all produced, middle feebly carinate, very little longitudinally sulcate on each side, supraocular lobes indistinct; frontal costa little compresso-elevated between the antennæ. Pronotum anteriorly cylindrical, subulate posteriorly, little concave backwards, and extended beyond the knees of the hind femora and

slightly beyond the wings, the apical process little upturned at the tip, dorsum of pronotum nearly smooth, conspersed with granules, little bifossulate behind the shoulders; median carina in profile undulate, before the shoulders compresso-arcuate, and forward behind the anterior margin obliterated, but distinct posteriorly; lateral carinæ of pronotum wanting: the lateral margins of pronotum just above the elytra at sides longitudinally sulcate; lateral lobes with the posterior angles strongly produced outward on each side in a transverse acute spine, stout, and triangular. Elytra small and lanceolate; wings largely concealed by the pronotum posteriorly. Anterior and middle femora rather slender, the margins entire; the apical denticles of posterior knees subacute, the ante-genicular denticles moderately distinct; the first articles of the posterior tarsi having the first pulvilli smallest and acute, the third barely longer than the second, subflattened below. Length of body entire, female, 15 mm.; pronotum 14.5 mm.; posterior femora 7 mm.

One example from (Kuching?) N.W. Borneo; Sarawak Museum, No. 344; Oxford Museum.

2. *B. planus*, sp. nov.

Greyish fuscous, the face similarly coloured, but the legs lighter, the posterior femora externally light above, striated with fuscous below, posterior tibiæ fuscous. Vertex very narrow, in front barely more than half the width of one of the globose eyes, ascendant forward; frontal costa barely compresso-elevated between the antennæ, face oblique, scarcely sinuate. Pronotum anteriorly cylindrical, the prozonal carinæ very indistinctly indicated, posteriorly subulate and extended little beyond the knees of the hind femora; the dorsum interspersed with coarse granulations, subpunctate posteriorly, between the shoulders bearing indistinct, abbreviated, secondary costa; median carina subincrassate, but low, obliterated behind the anterior border, posteriorly straight, but little compresso-arcuate forward before the shoulders; lateral lobes with the posterior angles on each side bearing a transverse spine, strongly narrowed acute. Elytra small, lanceolate, and black; wings fully explicate but extended only as far backward as apex of pronotal process, coloured black or fuscous. Anterior and middle femora elongate, narrow, margins entire; posterior femora externally bearing strongly expressed oblique costæ; the first and second pulvilli of posterior tarsi equal in length, acute, the third longer and flattened below. Length of body entire, female, 12 mm.; pronotum 11 mm.; posterior femora 5.7 mm.

One example from Mt. Matang, 3000 feet, near Kuching, N.W. Borneo; Sarawak Museum, No. 342; Oxford Museum.

This species is readily distinguished from *validispinus*, by the smaller stature, being narrower between the shoulders, in the more coarsely granulate pronotum, the more slender thoracic spines, the less extended and straighter pronotum, and the black elytra and wings.

3. *B. perminutus*, Bolivar, Ann., Soc. Ent. Belg. xxxi, p. 227, 228, 1887.

This species occurs in the Philippines, and was described by Bolivar under the caption *Criotettix*. It was inadvertently omitted from my list of the species of *Criotettix* in my article in *Genera Insectorum* (48me Fasc. Orthoptera, Subfam. *Tetriginæ*, p. 28, 1906), but it is referred to there in a foot-note. Attention was called to the species as belonging to a new subgenus. I find it falls naturally under the new genus *Bolotettix* above described.

4. It is quite likely that *Criotettix nigellus* (Bolivar, Ann. Soc. Ent. Belg., p. 225, xxxi, 1887) belongs here also. It is from Gaboon (Bolivar).

#### Genus OCYTETTIX, nov.

Recalling *Charagotettix*, to which it bears a near resemblance. Body strongly rugose; vertex wide, transverse, imperfectly carinate forward, on each side bearing a small compresso-acute carina, inwardly interrupted, fossulate on each side of the small median carina; eyes small; face moderately oblique, strongly sinuate; frontal costa roundly compresso-produced between the antennæ, viewed in front sulcate little above the posterior ocelli, below the rami moderately subparallel to the median ocellus; posterior ocelli placed between the lower third of the eyes; antennæ inserted distinctly before the eyes; maxillary palpi little compresso-ampliate apically. Pronotum anteriorly truncate, middle of the anterior margin often excavate, posteriorly acuminate, the apex spinose, often upturned and not extended backward beyond the knees of the hind femora; dorsum strongly depressed, often unigibbose forward and transversely fossulate between the shoulders, backwards often quadrinodulose; the humeral angles produced outwards laterally and strongly carinate, the lateral margins just before and behind the shoulders strongly elevated; the lateral carinæ profoundly compresso-sinuate; median carina strongly compresso-gibbose in front of the shoulders, depressed and indistinct behind the anterior margin, anterior prozonal carinæ strongly expressed, fossulate between them, lateral scapular area at the sides wide; lateral lobes at

the interior border often bearing a tubercle on each side, the posterior angles widely laminate, produced outwards and triangular acute, obliquely truncate behind. Elytra and wings wanting. Anterior femora elongate, lobate; posterior femora above externally bearing a series of large subrounded tubercles, and at the middle bituberculate, margins serrulate, the genicular and antegenicular denticles stout, subtriangular, posterior tibæ little ampliate towards the apices, the canthi plurispinose and minutely serrulate.

1. *O. latihumerus*, sp. nov. (Plate XXI, fig. 4.)

Body obscure ferruginous, infuscated, legs fuscous and pale annulate. Pronotum dilated between the humeral angles, the dorsum having the anterior gibbosity distinctly elevated, convex forward and declivous backward, posteriorly provided with two pairs of low subacute nodules; the posterior angles of the lateral lobes having the margin behind the thoracic spines somewhat serrulate. Anterior femoral margins above subbilobate, with a median denticle below; the posterior femora having the first denticle situated at the middle of the external pagina little produced, the second smaller. Length of body entire, female, 12·5; pronotum 10 mm.; posterior femora 7 mm.

One example from N.E. Madagascar, Bay of Antongil, Mocquerys; Oxford Museum.

Section METRODORÆ, Bolivar.

Genus SYSTOLEDERUS, Bolivar.

1. *S. greeni*, Bolivar, Ann. Soc. Ent. France, vol. lxx, p. 584, 1901.

Six examples from Pundaluoya, Ceylon; Oxford Museum.

2. *S. parvus*, sp. nov.

A small species, smoothly granulate; cinero-ferruginous, with black wings. Head little exerted; eyes globose and strongly approximate; vertex narrowly acuminate; frontal costa between the eyes vertically declivous, not at all sinuate; antennæ inserted distinctly before the eyes; posterior ocelli placed on a plane with the antero-ventral border of the eyes. Pronotum smoothly granulate, anteriorly truncate, cylindrical forward, and behind the anterior margin slightly ascendant, posteriorly subulate; median carina of pronotum very thin, low, and indistinct; the posterior angles of the lateral lobes turned down, subobtuse. Elytra light, elongate, margins above substraight, below curvate, acuminate forward and

apically, the external surface very lightly punctate; wings fully explicate. Legs light ferruginous, margins of anterior and middle femora little compressed, entire. Length of the body entire, female, 11 mm.; pronotum 10.2 mm.

One example from Kuching, N.W. Borneo; Sarawak Museum, No. 358; Oxford Museum.

#### Genus RHYNCHOTETIX, nov.

Body smoothly punctate; face profoundly retreating; vertex strongly rostrate, viewed from above the rostrum very much longer than the length of one of the narrow eyes, the apex distinctly rounded, the middle longitudinally carinate; frontal costa very narrowly sulcate, the carina above compressed, percurrent forward underneath the process to the apex; eyes viewed from above narrowly subelliptical, in profile compresso-conoidal; superior ocelli placed on a plane with the lower third of the eyes; the median ocellus placed far below the eyes; antennæ inserted little before (below) the antero-ventral border of the eyes. Pronotum truncate anteriorly, the margin little convex produced, posteriorly acuminate, but not spinose, toward the apex little concave and extended backward little beyond the posterior femoral knees; dorsum narrow between the shoulders, cylindrical forward, the prozonal carinæ here obliterated; median carina low deplanate forward, but little elevated and distinct posteriorly; lateral carinæ low; lateral lobes with the anterior margin below obliquely excised, the posterior angles of the lateral lobes little laminate outwards, distinctly produced in an acute spine on each side. Elytra and wings wanting. Middle femora elongate, margins little compressed entire; genicular and antegenicular denticles moderately stout; the posterior tibiæ little ampliate toward the apices, the canthi spinose, the first article of the posterior tarsi distinctly longer than the third. Type *Rhynchotettix rostratus*.\*

#### 1. *R. rostratus*, sp. nov. (Plate XXI, fig. 7.)

Fusco-ferruginous, with lighter longitudinal striation on each side of dorsum, posterior femora with the external faces below striated with fuscous. Rostrum triquetrous, strongly produced and when viewed from above about one and a half times longer than the length of one of the narrow eyes, the base of process subequal in width to one of the eyes; frontal costa viewed in profile roundly excavate opposite the eyes, and below very slightly sinuate, between

\* This genus belongs to the second subsection under *Metrodora*, as given in my article *Tetriginæ*, Genera Insectorum, p. 32, 1906.



the antennæ very slightly compresso-elevated. Pronotum with the dorsum finely punctate, frontal margin rounded-truncate, posteriorly acuminate, the apical process extended little beyond the knees of the hind femora, and little longitudinally concave; posterior angles of the lateral lobes armed on each side with an acutely-produced spine, obliquely truncate behind; the pulvilli of the posterior tarsi distinctly flattened below, the first smallest, the second and third equal in length, and longer than the first. Length of body entire, female, 14.8 mm.; pronotum 11.8 mm.; posterior femora 6 mm.

One example from N.E. Madagascar, Bay of Antongil, Mocquerys; Oxford Museum.

Genus *MITRITETTIX*, Hancock.\*

1. *M. proccsus*, sp. nov. (Plate XXI, fig. 8.)

Stature little larger than *phyllocera*, which it nearest resembles. Body finely punctate, granulate; grayish ferruginous. Vertex rostrate, flattened above, subnarrowed forward, horizontally produced, about twice the length of one of the eyes, and at the base nearly twice the width of one of the eyes; viewed from above the first half of the process with the sides subparallel, at the middle of the rostral margins angularly excavate on each side; the apical half of process being little narrower than the first half, and little dilated at about the middle, forward the sides converge forming an obtuse angle in front, middle carinate, slightly longitudinally sulcate on each side; head viewed in profile little convex above, the rostrum often little bent downward, face oblique; frontal costa somewhat widely sulcate, dividing above the posterior ocelli, the carina above passing forward on the underside of the rostrum strongly compresso-elevated; posterior ocelli placed between the submiddle part of the eyes, a little in advance of them; median ocellus situated far below the eyes; maxillary palpi with the apical articles dilated; antennæ short, inserted scarcely below the antero-ventral border of the eyes; maxillary palpi with the apical articles dilated. Pronotum anteriorly truncate, little angulate produced at the middle of the front margin, posteriorly strongly acuminately produced beyond the knees of the hind femora, the process stout; dorsum deplanate, smoothly punctate, sometimes slightly rugulose, narrow between the shoulders; prozonal carinæ parallel, humeral angles widely obtuse; median carina compressed, elevated before the shoulders subtectiform,

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\* The name *Mitritettix* was proposed by the writer for Bolivar's *Mitraria*, the latter name being preoccupied. Vide article in *Genera Insectorum*, 48me Fasc., p. 51, 1906.

depressed between the shoulders and distinct behind the shoulders backward; lateral carinæ indistinct, granulate; lateral margins just above the elytra sulcate; lateral lobes of pronotum little reflexed outwards, slightly laminato-rectangulate. Elytra small, elongate, rather narrow, subacuminate towards the apices; wings fully explicate, not quite reaching to the apex of the pronotal process. Femoral margins minutely serrulate, anterior femora compressed, the superior carina distinctly compresso-arcuate; middle femoral margins little compressed, in the male distinctly ampliate toward the base; hind femora narrow elongate, the genicular and antegenicular denticles rather stout, acute; posterior tibiæ with the canthi minutely serrulate, plurispinose, and scarcely at all ampliate toward the apices; the first and third articles of the posterior tarsi equal in length, the three pulvilli equal in length, somewhat flattened below. Length of body entire, male and female, 19-21.5 mm.; pronotum 16-19 mm.; posterior femora 6.8-7.5 mm.

Four examples from Kuching, N.W. Borneo. One from the Sarawak Museum, No. 340, the others from R. Sheldford; Oxford Museum.

#### Genus TETTICERUS, Hancock.

1. *T. bigibbosus*, Hancock, Occasional Mem. Chicago Ent. Soc., vol. i, No. 1, p. 5, Pl. I, figs. 1-1b, 1900.

Four examples from N.E. Madagascar, Bay of Antongil, Mocquerys; Oxford Museum.

#### Genus CRYPTOTETTIX, Hancock.

1. *C. spinilobus*, Hancock, Occasional Mem. Chicago Ent. Soc., vol. i, No. 1, p. 14, 15, Pl. I, figs. 6-6b, 1900.

Two examples from N.E. Madagascar, Bay of Antongil, Mocquerys; Oxford Museum.

#### Genus MAZARREDIA, Bolivar.

1. *M. insularis*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 240, 1887.

Four examples from Pundaluoya, Ceylon; Oxford Museum.

2. *M. centrosa*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 242, 1887.

Two examples from Kuching, N.W. Borneo, Sarawak Museum, Nos. 352 and 355; Oxford Museum.

3. *M. planitarsus*, sp. nov.

Resembling *sculpta*; stature rather slender; grayish fuscous; head not at all exerted; vertex flattened, slightly wider than one of the eyes, little narrowed forward, on either side with oblique carina, the middle carina obscure, indistinctly sloping forward; frontal costa viewed in profile compresso-protuberant between the antennæ, the face strongly sinuate below; eyes globose, sessile, not higher than the dorsum. Pronotum gibbose forward, rather narrow between the shoulders, very strongly produced backwards equal to the length of the hind femora beyond the femoral apices; median carina elevated gibbose between the shoulders, abruptly declivous posteriorly and behind the shoulders depressed, posteriorly straight; dorsum behind the prozonal carinæ forward at the sulci constricted, humeral angles widely obtuse, bicarinate; lateral carinæ on process posteriorly serrulate; anterior prozonal carinæ distinctly expressed, rather short and little divergent backward; dorsum on each side bearing an abbreviated costa scarcely in front of the shoulders, and a pair of lineate tubercles or protuberances above the middle of the posterior femora; lateral lobes little reflexed outwards, produced angulate. Elytra moderately large, oval, little narrowed toward the apices, externally strongly punctate; wings fully explicate, extended backward as far as the pronotal apex. Anterior and middle femora elongate, the margins little compressed undulate, the superior carina of the anterior femora noticeably compressed; the canthi of posterior tibiæ minutely spinose and serrulate; the first articles of the posterior tarsi very slender, longer than the third, the pulvilli strongly deplanate below and almost obliterated, the apical pulvillus very small acute. Length of body entire, male and female, 14.8-16.5 mm.; pronotum 14-15.5 mm.; posterior femora 5-5.8 mm.

Four examples from Kuching, N.W. Borneo. One of these specimens from Sarawak Museum, No. 347, the others from R. Shelford; Oxford Museum.

Genus XISTRA, Bolivar.

1. *X. stylata*, sp. nov.

Ferruginous. Head compresso-elevated, in profile sinuate. Vertex cornute, strongly concavely depressed forward, on each side the oblique carinula strongly elevated and formed into an acute, vertically-produced, cylindrical spine, which curves a little forward, extended above the eyes, equal to about four-fifths the height of one of the eyes; eyes elevated and conico-rotundate, substylate; posterior ocelli placed barely below the eyes; antennæ inserted far below the

eyes; the frontal costa rather widely sulcate, evenly divergent forward to the median ocellus, little compresso-elevated between the antennæ. Pronotum granulate, posteriorly lengthily subulate, extended beyond the hind femoral apices; dorsum little ascendant near the anterior margin, between the shoulders elevated, compresso-cristate, the top of crest subdentate, before and behind the crest the median carina often little compresso-dentate; median carina low forward just behind the anterior margin and posteriorly on the process; humeral angles widely obtuse, the lateral carinæ continuous forward on the shoulders; the anterior prozonal carinæ parallel; posterior angles of the lateral lobes subangulate, slightly reflexed, subrounded-truncate. Elytra elongate, apices narrowly rounded, externally punctate, fuscous with light apices; wings fully explicate, barely extended beyond the pronotal apex; anterior and middle femora elongate, the carinæ distinctly compressed, undulate, the superior carinæ of the middle femora produced in an apical spine; posterior femora elongate, genicular spine acute, little produced; the three pulvilli of the first tarsal articles equal in length. Length of the body entire, female, 16.2 mm.; pronotum 15 mm.; posterior femora 5.9 mm.

One example from Putlam, Ceylon, in the Oxford Museum.

This species is nearly allied to *Xystra corniculata*, Stål.

#### Genus NOTOCERUS, Hancock.

1. *N. cornutus*, Hancock, Occasional Mem. Chicago Ent. Soc., vol. i, No. 1, p. 5, 6, figs. 2, 2a, 1900.

Three examples from N.E. Madagascar, Mocquerys; Oxford Museum.

#### 1a. *Var.*

Similar to *cornutus*, but of smaller stature, the male and female measuring as follows: entire length 16-16.5 mm.; pronotum 14-15.4 mm.; posterior femora 6-7 mm. In the male the wings extend beyond the pronotal apex, and in this sex the pronotum between the elevated humeral angles is transversely convex and little tumose; the median carina here being low, but in the female little compressed, otherwise similar to *cornutus*.

Two examples from the same locality as the preceding.

#### Genus HYBOTETTIX, Hancock.

1. *H. humeralis*, Hancock, Occasional Mem. Chicago Ent. Soc., vol. i, No. 1, p. 9, 10, fig. 4, Pl. I, 1900.

One female example which measures as follows: entire length 18 mm.; pronotum 17 mm.; posterior femora 8 mm. From N.E Madagascar, Bay of Antongil, Mocquers; Oxford Museum.

Genus *CAMELOTETTIX*, nov

Resembling *Notocerus* and *Hybotettix*, but differing in the vertex bearing more perceptibly compresso-marginate carinæ laterally before the supraocular lobes, and distinctly fossulate on each side of the feeble median carina; the frontal costa but very little compresso-elevated between the antennæ, the rami evenly divergent forward to the median ocellus; the eyes in profile globose instead of ovoid; the pronotum at the shoulders slightly dilated, in profile the lateral carinated margins widely arcuato-elevated above the articulation of the hind femora, the dorsum smoothly deplanate, but transversely plurifossulate; the lateral lobes of pronotum with the elytral sinus nearly as pronounced as the inferior one below. Type *Camelotettix curvinotus*.

1. *C. curvinotus*, sp. nov. (Plate XXI, fig. 6.)

Grayish-ferruginous; body smoothly granulate, quadrate in section or in front view; vertex transverse, but not transversely carinate, flattened, anteriorly convex, nearly twice the width of one of the eyes, laterally compresso-marginate forward of the supraocular lobes, strongly fossulate on each side of the feeble median carina; eyes sessile, not higher than the dorsum; posterior ocelli placed between the submiddle plane of the eyes; antennæ inserted barely before the ventro-anterior border of the eyes; apical articles of maxillary palpi little dilated. Pronotum anteriorly truncate, the dorsal front margin somewhat roundly excavate, posteriorly acuminate, extended backward beyond the knees of the hind femora, the shoulders widely rounded, carinate, and viewed in profile strongly arcuately elevated; dorsum transversely trifossulate, sloping backward; the median carina strongly sinuate; before the shoulders bearing an abbreviated parallel costa on each side; prozonal carinæ granulate, little convergent backward; lateral lobes with the posterior angles little laminate, subacute produced, obliquely truncate behind: the lateral carinæ on each side of the pronotum between the shoulders and elytra formed in a wide arc far above the elytra (in *Hybotettix* it is sulcate). Elytra of moderate size; wings fully explicate, extended backward nearly to the pronotal apex. Femora elongate, margins entire, the antegenicular spines small, acute, the genicular spine little acute produced; posterior tibiæ somewhat curvate, little ampliate toward the

apices, the canthi armed with stout spines; the first and third tarsal articles equal in length, the three pulvilli of the first tarsal articles equal in length, but the first more rounded below than the rest. Length of body entire, female, 16.5 mm.; pronotum 15.5 mm.; width between the shoulders 3.5 mm.; posterior femora 7 mm.

One example from Bali, Doherty; Oxford Museum.

#### Genus DASYLEUROTETTIX, Rehn.

1. *D. curriei*, Rehn, Proc. Acad. Nat. Science, Philadelphia, p. 658, 1904.

One example, a male, differs from the type in being less rugose on the pronotum, and in the frontal costa being narrower. From Natal, Africa; Oxford Museum.

NOTE.—This genus was formerly placed in the section *Cladonotæ*, but an examination of type specimens, recently acquired, convinces me that it belongs in the section *Tetrigiæ*, taking a place near *Tetrix*. Indeed this species recalls *Tetrix depressus*, Bris., as its nearest relative.

#### Genus ALLOTETTIX, Hancock.

1. *A. americanus*, sp. nov.

Ferruginous. Vertex little ascendant forward and distinctly narrowed, strongly narrower than one of the eyes, tricarinate; frontal costa sulcate above the posterior ocelli, the rami moderately divergent forward to the median ocellus, in profile roundly compresso-elevated, produced, between the antennæ; eyes roundly conoidal in profile, little elevated above the dorsum of pronotum; posterior ocelli rather conspicuously showing in advance of the eyes on a plane little below the middle; antennæ inserted distinctly before (below) the eyes, the articles strongly elongate, the first articles grossly compressed. Pronotum depressed, rugose, convex between the shoulders and somewhat narrow, the shoulders bicarinate, widely obtuse, posteriorly lengthily subulate, extended backward beyond the knees of the hind femora; median carina little compressed, lightly sinuate, little excavate behind the anterior margin; anterior prozonal carinæ distinctly expressed, slightly convex; lateral lobes with the posterior angles turned downward, obtuse. Elytra narrow and somewhat acuminate posteriorly; wings fully explicate, extended backward beyond the pronotal apex. Anterior and middle femoral margins entire; hind femora of ordinary form, the hind tibiæ rather stout, distinctly ampliate toward the apices, the margins armed with stout spines; the first articles of the posterior tarsi stout and scarcely

shorter than the third, the first two pulvilli of the first tarsal articles short and acute, the third pulvilli longer and somewhat flattened below but acute.

One example from Cachabi, Ecuador, S. America; Rosenberg; Oxford Museum.

Readily distinguished from the other members of this genus by the narrowed vertex, which is strongly narrower than one of the eyes and tricarinate, and also by the extended wings which pass beyond the pronotal apex.

### Genus OTUMBA, Morse.

#### 1. *O. quadrata*, sp. nov.

Somewhat resembling *scapularis*. Pale ferruginous; head little exerted, face oblique; vertex ascendant forward but very little narrowed, convex, advanced nearly as far as the eyes, the carinæ laterally little roundly compressed, at the front almost as wide as one of the eyes, middle carinate, sulcate on each side; frontal costa declivous above, between the antennæ little compresso-elevated, and sinuate below, between the posterior ocelli narrowly sulcate, evenly divergent forward to the median ocellus; eyes roundly conoidal, higher than the dorsum of pronotum; posterior ocelli placed between the lower third of the eyes; antennæ inserted distinctly before the ventro-anterior border of the eyes. Pronotum rugose or often rugulose, depressed, deplanate between the shoulders; median carina very low and indistinctly sinuate, almost straight posteriorly and lengthily acuminate, extended beyond the knees of the hind femora; prozonal carinæ distinct and parallel; humeral angles obtuse, bicarinate; lateral lobes with the posterior angles strongly reflexed outwards, rectangulate, but convexo-truncate behind. Elytra small, acuminate toward the apices; wings fully explicate reaching just beyond the pronotal process. Margins of anterior and middle femora little compresso-undulate; the posterior femora bearing a series of large tumose tubercles above on the outer faces, the antegenicular spine acute, but the genicular spine nearly wanting, posterior tibiæ very little ampliate toward the apices, the canthi sparingly spinose; the first and second pulvilli of the first tarsal articles equal in length; subacute, the third pulvilli little longer and more flattened below, Length of body entire, male and female, 12-13 mm.; pronotum 11-12 mm.; posterior femora 5-6 mm.

Five examples from Cachabi, Ecuador, S. America. Rosenberg; Oxford Museum.

## Section TETRIGLÆ, Bolivar.

## Genus PARATETTIX, Bolivar.

I recognize four Bornean species of *Paratettix*, which may be distinguished by the following key\*—

1. Pronotum somewhat broad between the shoulders; the lateral lobes conspicuously reflected outwards, triangular and acute; first two basal pulvilli of the first tarsal articles spiculate . . . . . *variabilis*, Bol.
2. Pronotum narrower between the shoulders; the lateral lobes little produced outwards, and angulate-subacute; the first two basal pulvilli of first tarsal articles not spiculate . . . . . *angulobus*, sp. nov.
3. Posterior angles of the lateral lobes of pronotum narrowly rounded; vertex of head strongly narrower than one of the eyes; length of pronotum from 9 to 12 mm. . . . . *histicus*? Stål.
4. Posterior angles of lateral lobes subtriangular, indistinctly turned outward; vertex of head narrowed forward, subequal or little narrower than one of the eyes; pronotal process often extended as far as the wings; length of pronotum from 12 to 15 mm. . . . . *lineatus*, sp. nov.

1. *P. variabilis*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 276, 1887.

Three examples from Kuching, N.W. Borneo, R. Shelford; Oxford Museum.

2. *P. angulobus*, sp. nov.

A very slender-bodied species, with prominent globose eyes, fusco- or grayish-ferruginous; vertex ascendant forward, strongly narrowed, tricarinate, at the front much narrower than one of the eyes, occiput behind the eyes exposed; eyes higher than the dorsum of pronotum; frontal costa rather roundly compresso-elevated between the antennæ, not at all sinuate; apical articles of maxillary palpi oval; the antennæ inserted almost between the inferior border of the eyes. Pronotum often lightly rugulose, depressed, little ascendant behind the anterior margin, subdeplanate between the shoulders and bearing

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\* One of the common species of *Tetriginæ* in Borneo is *Paratettix contractus* of Bolivar. This species is considered a *Tetrix* here, and will be so treated further on under that heading.



an abbreviated costa on each side ; the shoulders indistinctly bicarinate ; median carina forward little sinuate, horizontally straight posteriorly, process lengthily acuminate, strongly extended beyond the knees of the hind femora ; posterior angles of lateral lobes reflexed outwards and angulate-acute. Elytra oval ; wings fully explicate, extended beyond the pronotal apex, caudate. The first and third articles of the posterior tarsi equal in length, the three pulvilli of the first tarsal articles nearly equal in length. Length of body entire, male and female, 13-14 mm. ; pronotum 11-12 mm. ; posterior femora 4.6-5 mm.

Five examples from Kuching, N.W. Borneo ; Oxford Museum. Two of these specimens from the Sarawak Museum, Nos. 353 and 351, the others from R. Shelford.

3. *P. histricus*? Stål, Freg. Eüg. resa. Ins. Orthopt., p. 347, 1860.

One example from Kuching, N.W. Borneo ; R. Shelford, Oxford Museum.

4. *P. lineatus*, sp. nov.

Ferruginous, legs lighter. Head not at all exerted ; vertex narrowed forward, subequal in width to one of the eyes ; the frontal costa arcuate ; eyes moderately small, globose ; posterior ocelli unusually large and conspicuously showing just in advance of the middle of the eyes. Pronotum lengthily subulate, rather smooth, bicarinate at the shoulders, the dorsum convex between the shoulders and bearing abbreviated costa on each side forward ; lateral lobes not at all reflexed outwards, truncate ; elytra oblong ; wings fully explicate, extended backward just beyond the pronotal apex. Femoral carinæ entire ; the first tarsal articles having the second pulvilli very little smaller than the first and third, all the pulvilli flattened below, not spiculate. Length of body entire, male and female, 13.5-16 mm. ; pronotum 12-15 mm. ; posterior femora 5-6 mm.

Six examples from Kuching, N.W. Borneo. One of these specimens from Sarawak Museum, No. 345, the rest from R. Shelford ; Oxford Museum.

This species may possibly be a *Coptotettix*.

Genus APOTETTIX, Hancock.

1. *A. proximus*, sp. nov.

A South American form of rather small stature, with subquadrate vertex, resembling *Paratettix frey-gessneri*, and dimorphic in wing-length. Greyish, the tibiæ and tarsi fusco-annulate. Vertex little

wider than one of the eyes, longitudinally fossulate on each side of the distinct median carina, the front margin subtruncate; frontal costa rather widely sulcate, in profile little arcuate produced between the antennæ, subsinuate above and below; eyes of moderate size. Pronotum little rugose granulate, somewhat deplanate between the shoulders, acuminate posteriorly and extended to or beyond the knees of the hind femora; median carina percurrent, compresso-arcuate forward before the shoulders, little lowered and often subsinuate backward, but straight on the process; lateral lobes little reflexed outwards, the posterior angles distinctly rounded or obtuse. Elytra oblong; wings fully explicate, abbreviated and not extended to the apices of the posterior femoral knees, or passing beyond the apex of pronotal process or even caudate. The first tarsal articles with the first and second pulvilli small and spiculate, the third much longer and flattened below. Length of body entire, male and female (short-winged form), 7·5–9 mm.; pronotum 7–7·8 mm.; posterior femora 4·5–5 mm. Long-winged form, male, 10 mm.; pronotum 8 mm.; posterior femora 4·5 mm.

Five examples, from Cachabi and Paramba, Ecuador, S. America; Rosenberg.

#### Genus EUPARATETTIX, Hancock.

1. *E. personatus*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 278, 1887.

One example from West Java; H. Fruhstorfer. Two examples from N.C. Province, Ceylon; Oxford Museum.

2. *E. minus*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 278, 1887.

One example from Penang Island, E. L. Meyer, coll.; Oxford Museum, No. 3451.

3. *E. indicus*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 281, 1887.

Four examples from (Assam ?) India; Oxford Museum.

4. *E. similis*, sp. nov.

A rather small form, with the head little exserted. Vertex hardly narrowed forward, nearly equal or subnarrower than one of the globose eyes, little ascendant forward; median carina distinct, sulcate on each side; the frontal costa slightly compresso-arcuate between the antennæ, declivous above; eyes barely higher than the dorsum. Pronotum lengthily acuminate posteriorly, little

rugose, without supernumerary costa, convex between the shoulders, the humeral angles distinct and carinate; the anterior prozonal carinæ very small, subobsolete; median carina percurrent, slightly incassate, little compresso-elevated forward and there often subundulate, but straight posteriorly; pronotal process strongly extended backward beyond the hind femoral knees; lateral lobes distinctly turned down, the posterior angles narrowly rounded. Elytra oval; wings caudate. Anterior and middle femoral margins entire; posterior femoral carinæ above arcuate; the first and third articles of the posterior tarsi equal in length, the first tarsal articles having the first and second pulvilli spiculate, the third nearly as long as the first and second united and flat below. Length of body entire, male and female, 11-12 mm.; pronotum 9-10 mm.; posterior femora 4-4.7 mm.

Six examples from Banguay, and one from Kina Balu-Borneo, in the author's collection. Examples are in the Oxford Museum from the Philippines, Nos. 2769 and 2770, and from Kuching, N.W. Borneo, R. Shelford.

Genus *TETRIX*, Latreille.

1. *T. contractus*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 281, 1887.

Numerous examples in the collection of the Oxford Museum, from Kuching, N.W. Borneo, R. Shelford.

This species seems nearer to *Tetrix* than *Paratettix*. The vertex is subwider than one of the eyes and rounded, not truncate; the frontal costa being distinctly sinuate, excavate between the eyes. It is apparently one of the commonest species in Borneo. This species was placed in the genus *Paratettix* by Bolivar.

2. *T. atypicalis*, Hancock, Spolia Zeylanica ii, p. 143, 144, 1904.

Two examples from Pundaluoya, Ceylon; Oxford Museum.

3. *T. a. ceylonus*, Hancock, Spolia Zeylanica ii, p. 143, 144, 1904.

Two examples from Pundaluoya, Ceylon; Oxford Museum.

4. *T. cuspidatus*, sp. nov.

Resembling *Tetrix contractus*. Greyish, with the dorsum behind the shoulders often fusco-maculate. Vertex little depressed, not at

all narrowed forward, anteriorly convex, tricuspidate, subequal in width to one of the eyes, the fronto-marginal carinae laterally little compresso-elevated and acute, viewed in profile the cusps often little elevated above the eyes, lateral margins of vertex not at all sinuate, median carina produced, in profile protuberant; frontal costa in profile strongly sinuate, excavate between the eyes, little compresso-elevated between the antennae and excavate below, the rami moderately and evenly divergent to the median ocellus. Pronotum depressed, between the shoulders convexo-deplanate, the humeral angles distinct, carinate, and slightly produced laterally; median carina percurrent but sinuate, little compresso-elevated before shoulders and little excavate just behind the anterior border, pronotal process strongly extended backward beyond the apices of the posterior femora; posterior angles of the lateral lobes rounded, the inferior margins little reflexed outwards. Elytra oblong or somewhat oval with the apices subacuminately rounded; wings caudate. Anterior and middle femoral margins distinctly compressed, the superior margins of the anterior femora distinctly compresso-elevated, the carinae undulato-arcuate; middle femoral carinae above and below undulate; the external paginae of the posterior femora rugose, the oblique costa strongly expressed and rugose-granulate; the first and third articles of the posterior tarsi about equal in length, the first and second pulvilli subacute, the third nearly as long as the first and second united and flat below. Length of body entire, male and female, 12.5-13 mm.; pronotum 10.5-11 mm.; posterior femora 4-4.5 mm.

Four examples from West Java, Pengalengan, 4000 ft.; Oxford Museum.

#### Genus HEDOTETTIX, Bolivar.

1. *H. graevis*, Haan, Bijdr. Orthopt., p. 169 (= *festivus*).

Six examples from Java, H. Fruhstorfer; Oxford Museum. Four examples from Ceylon and one from Chenapungi, also in Oxford Museum.

2. *H. guibelondoi*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 285, 1887.

One example referable to this species, from the Philippines, in the Oxford Museum, No. 2771.

3. *H. burri*, Hancock, Occas. Memoirs Chicago Ent. Soc., vol. i, No. 1, p. 10, 11, 1900.

Originally described from a male example from Madagascar under the genus *Telmatettix*. A second specimen in the Oxford Museum from the same locality, being a female, allows me opportunity of revising my opinion of this species. This species resembles *Paratettix scaber* from Africa, and it may be quite possible that it is this species. The antennæ are inserted between the inferior part of the eyes, as in *Hedotettix*.

4. *H. celebicus*, sp. nov.

A very slender-bodied species; greyish-cinereous or flavous, variegated with fuscous. Head little exerted; vertex scarcely narrowed forward, narrower than one of the eyes, sulcate on each side of the median carina, not at all ampliate toward the front; frontal costa slightly arcuate, the face in profile not at all sinuate, rami divided distinctly above the posterior ocelli, moderately sulcate. Pronotum truncate anteriorly, subtectiform between the shoulders, posteriorly lengthily acuminate, the process extending beyond the femoral apices; median carina percurrent, somewhat acute, little elevated between the shoulders; dorsum granulate; the prozonal carinæ parallel; posterior angles of the lateral lobes turned down and narrowly rounded. Elytra with the apices somewhat widely rounded; wings strongly caudate. Anterior femoral carinæ straight; intermediate femora, in the male, little ampliate toward the bases, in the female, subnarrowed; the first tarsal articles with the first and second pulvilli acute-spiculate, the third much longer than the second, and straight below, the apices acute. Length of body entire, male and female, 11-14 mm.; pronotum 9-10 mm.; posterior femora 4-5 mm.

Three examples from Macassar, Celebes, Doherty; Oxford Museum.

Genus COPTOTETTIX, Bolivar.

1. *C. tuberculatus*, Bolivar, Ann. Soc. Ent. Belg. xxxi, p. 117, 1887.

Three examples from Kuching, N.W. Borneo, R. Shelford; Oxford Museum.

2. *C. rotundatus*, sp. nov.

Fuscous, the legs sometimes flavous or fusco-variegated; vertex not produced beyond the eyes, strongly narrowed forward, about equal in width to one of the eyes, fossulate on each side, in profile little roundly elevated above the eyes; the frontal costa strongly roundly produced in advance of the eyes, the rami dividing above the

posterior ocelli, moderately divergent forward to the median ocellus; the posterior ocelli placed in advance of the upper third of the eyes. Pronotum lengthily subulate, the dorsum rugose, often conspersed with very slightly elevated and elongated rugæ and coarsely granulate; median carina undulate, here and there slightly incrassate, but the other carinæ low and thin, the anterior prozonal carinæ very indistinct, granulate, and convergent backward; posterior angles of the lateral lobes narrowed and rounded. Elytra oval, the apices rounded; wings fully explicate and passing the pronotal apex. Anterior and intermediate femora elongate, the carinæ entire; the first articles of the posterior tarsi distinctly longer than the third, the first and second pulvilli of the first tarsal articles more acute than the third, the third being flat and longer than the second. Length of the body entire, male and female, 13-14.5 mm.; pronotum 11.5-13 mm.; posterior femora 5.5-6.5 mm.

Four examples from Kina Balu in the author's collection, and one from Kuching, N.W. Borneo, R. Shelford; Oxford Museum.

In this species the antennæ are inserted between the lower third or fourth of the eyes. The specific name *rotundatus* refers to the facial costa.

### 3. *C. parvus*, sp. nov.

This may be the short-winged form of *Coptotettix tuberculatus*. It is a small form with abbreviated wings and pronotum; the posterior angles of the lateral lobes turned down, and slightly more obtuse; the dorsum of pronotum rugose and bearing tubercles, some of which are abbreviated linear in form. The vertex resembles that of *tuberculatus*. Length of body entire, male, 8 mm.; pronotum 7 mm.; posterior femora 5.5 mm.

One example from Kuching, N.W. Borneo, R. Shelford; Oxford Museum.

### 4. *C. inflatus*, Krauss, Denkschr. Naturw. Ges. Jena Bd. 8, 1903, vol. iv, p. 745, Pl. LXVII, fig. 10, 1902.

Six examples from Java; Oxford Museum.

## Section BATRACHIDEÆ, Bolivar.

### Genus PHLÆONOTUS, Bolivar.

#### 1. *P. sinuatus*, sp. nov.

Similar to *natalensis*; greyish, fusco-variegated. Vertex wide, completely covered, strongly produced; face in profile arcuate;

frontal costa strongly advanced beyond the eyes, the rami somewhat widely sulcate, divided above the posterior ocelli near the vertex, and slightly divergent forward. Pronotum anteriorly produced scarcely beyond the head, the front margin on each side straight, convergent forward, angulate, but with obtuse apex; dorsum strongly compresso-cristate; the median carina forward between the shoulders strongly sinuate, posteriorly acuminate, extended little beyond the hind femoral apices. Elytra rather wide, oval, bearing a large black macula transversely intersected by a light fascia near the apices; wings fully explicate and extended beyond the pronotal apex. Posterior femora somewhat incrassate; the first and third articles of the posterior tarsi subequal in length, the three pulvilli of the first tarsal articles nearly equal in length. Length of body entire, male, 14 mm.; pronotum 12.5 mm.; posterior femora 7 mm.

One example from Natal or Orange River Colony, F. N. Brown; Oxford Museum, No. 3356.

#### Genus TETTIGIDEA, Scudder.

##### 1. *T. planus*, sp. nov.

This species has no spine at the termination of the superior carina of the middle femora, and the elytra are plainly coloured without macula; it resembles Scudder's species *Tettigidea cuspidata*.

Body granulate; ferruginous, often fusco-variegated. Vertex distinctly wider than one of the eyes, somewhat depressed and smooth, narrowed forward, the supraocular lobes small, the front margin advanced about as far as the eyes, the median carina absent, the frontal carinulæ on each side very little compressed, little rounded-concave; frontal costa narrowly sulcate, little compresso-elevated between the antennæ; maxillary palpi yellow, widely compresso-dilated at the apices, the apical articles oval. Pronotum anteriorly acute spiniform produced nearly as far as the front of vertex, the spine nearly straight, the front margin on each side of the spine strongly concave; posteriorly cuneate, extended backward nearly to the apices of the hind femoral knees; dorsum granulate, between the shoulders somewhat tectiform; median carina little incrassate, subundulate, nearly horizontal, little compressed and percurrent. Elytra elongate, acuminate toward the bases and apices, the external faces plain coloured and granulate; wings abbreviated. Hind femora elongate; the tibiæ fuscous with pale annulation near the bases, the first and third articles of the posterior tarsi subequal, the first, second and third pulvilli respectively gradually increasing in

length and subflattened below, not acute. Length of body entire, female, 12·8 mm.; pronotum 11·5 mm.; posterior femora 7·6 mm.

One example from Paramba, Ecuador; Rosenberg.

Genus SCARIA, Bolivar.

1. *S. fasciata*, sp. nov.

This is a remarkably graceful species, narrow between the shoulders, and having the pronotum anteriorly only little ascendant. Body granulate, flavo-ferrugineous, on either side bearing a broad, black, longitudinal fascia, the face, lower part of lateral lobes of pronotum and sides flavous, legs flavous, often tinged with fuscous. Eyes strongly globose; face oblique; vertex subtruncate, nearly equal in width to one of the eyes, scarcely advanced so far as the eyes, little narrowed forward and smooth, the median carina wanting; the frontal costa starting at the vertex little lower than the eyes, divides between the posterior ocelli and is arcuately protuberant forward between the eyes; superior ocelli large, conspicuously showing in profile just in advance of the middle of the eyes. Pronotum anteriorly acute spiniform produced, the antero-dorsal margin on either side of the spine roundly excavate, posteriorly lengthily extended beyond the apices of the hind femoral knees; dorsum between the shoulders convex, narrow; humeral angles bicarinate; anterior prozonal carinæ only little expressed, slightly divergent backward; median carina somewhat undulate, often little compresso-elevated forward between the shoulders, nearly horizontal, and forward at the front margin with the spine little ascendant and uncinatè. Elytra oblong, with a pale spot near the apices varying in intensity and size; wings fully explicate, extended beyond the pronotal apex. Posterior femora elongate, knees black, the superior carinæ forward black, with pale spots; tibiæ black but pale annulate toward the base and the apices, the canthi serrulate and rather feebly plurispinose; the three pulvilli of the first tarsal articles equal in length. Length of the body entire, male and female, 13-15 mm.; pronotum 11-14 mm.; posterior femora 5·5-6·3 mm.

A number of examples from Cachabi, Ecuador, Rosenberg; Oxford Museum, and in the author's collection.

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EXPLANATION OF PLATE XXI.

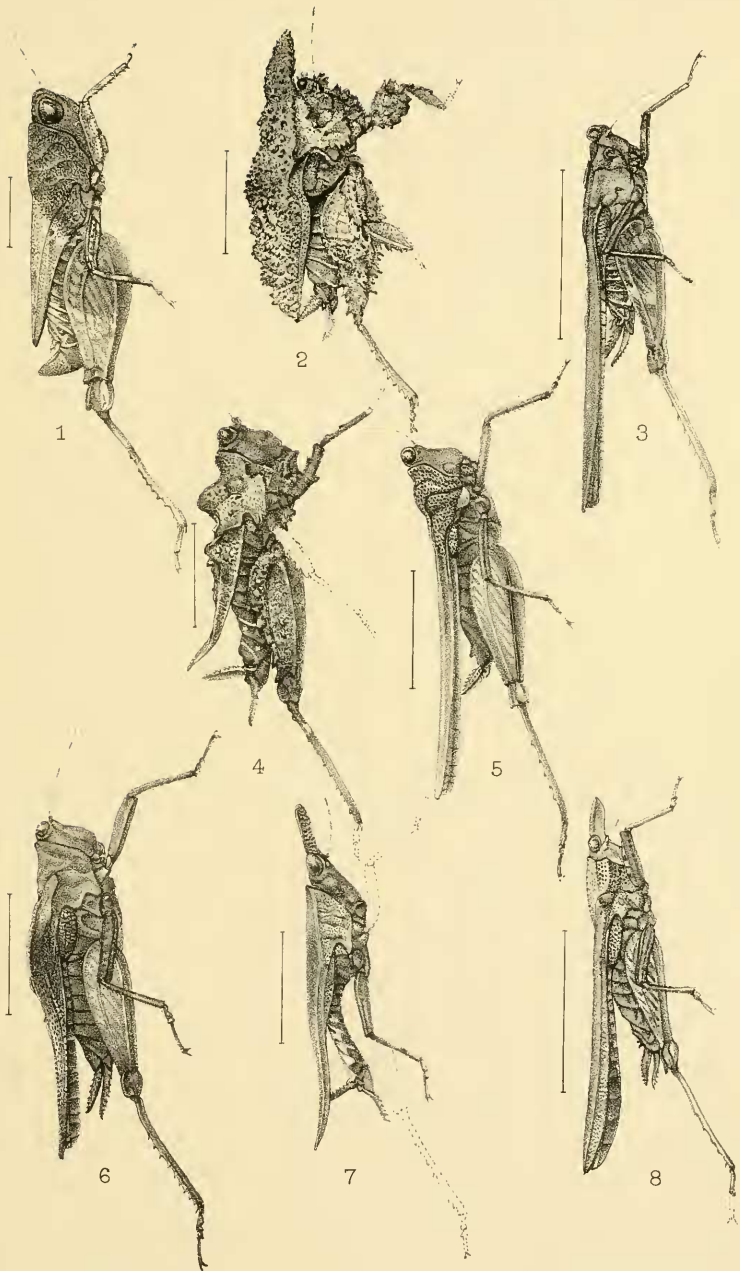
[See *Explanation facing the PLATE.*]



EXPLANATION OF PLATE XXI.

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H. Knight del et lith.

West, Newman imp.

NEW SPECIES OF TETRIGINÆ.